

APPENDIX E
ANALYTICAL DATA QA/QC REPORT

The Analytical Data QA/QC Report is provided here in electronic format only.

DATA VALIDATION SUMMARY REPORT
for samples collected from
FORT BLISS OB/OD SITE I, TEXAS

Data Validation by: Tammy Chang
Date: 5 May, 2017
Parsons - Austin

INTRODUCTION

The following data validation summary report covers three incremental soil samples and associated field quality control (QC) samples collected from OB/OD Site I of Ft. Bliss, Texas on March 15, 2017. Samples were logged in under the following Sample Delivery Group (SDG):

FA 42100

The samples in this SDG were analyzed for polynuclear aromatic hydrocarbons (PAHs) only. The QC samples involved were one set of matrix spike/matrix spike duplicate (MS/MSD) and one set of field triplicate samples. The table below details the requested parameters for each sample.

Incremental samples were collected by Parsons in plastic bags and shipped to SGS-Accutest, Orlando, FL in one cooler with ice. The cooler was received at 3.4°C.

The chemical analyses were performed following the procedures outlined in the laboratory Subcontract and the project specific Final Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP).

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	PAHs	Comments
OBOD1-AU01-SS-01	X	ambient sample, field triplicate
OBOD1-AU01-SS-02	X	ambient sample, field triplicate
OBOD1-AU01-SS-03	X	ambient sample, field triplicate
OBOD1-AU02-SS-01	X	ambient sample, MS/MSD
OBOD1-AU03-SS-01	X	ambient sample

EXTRACTION AND ANALYTICAL METHODS:

PARAMETER	MATRIX	EXTRACTION METHOD	ANALYTICAL METHOD	UNITS	DRY WT. VS. WET WT
PAH	S	3550B	8270D-SIM	mg/kg	Dry Wt.

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project specific UFP-QAPP. Information reviewed in the data packages included sample results; field and laboratory quality control results; calibrations; case narratives; raw data; cooler receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the UFP-QAPP were met.

Electronic data deliverable (EDD) software, Automatic Data Review (ADR), rules were applied for flagging the data as follows: If an analyte was detected in the method blank, the associated sample concentrations were examined. If the analyte was detected in a sample at a concentration similar to the concentration found in the blank (five times the blank concentration for most analytes, or ten times the blank concentration for common laboratory contaminants), sample results for that analyte which were less than the Limit of Quantitation (LOQ) were raised to the LOQ value and flagged "U", and sample results for that analyte which were greater than the LOQ were reported at the concentration found and flagged "U" for that particular sample.

SGS-Accutest reported the non-detect results in accordance with the requirements established in Department of Defense (DoD) Quality System Manual (QSM) version 5.0. For example, when the analysis demonstrates a non-detect at the Detection Limit (DL), the data was reported with the value of Limit of Detection (LOD) and flagged with a "U". Any results between LOQ and DL were reported with "J" flag.

Due to limitations in their LIMS reporting system, Accutest reported using internal laboratory spike tolerances and listed exceedances of DoD QSM limits in the report footnotes. DoD QSM limits listed below were used for data validation.

Analyte	Accuracy Criteria (Soil)	Maximum RPD (%)
1-Methylnaphthalene	43-111%	20
2-Methylnaphthalene	39-114%	20
Acenaphthene	44-111%	20
Acenaphthylene	39-116%	20
Anthracene	50-114%	20
Benz(a)anthracene	54-122%	20
Benz(a)pyrene	50-125%	20
Benzo(b)fluoranthene	53-128%	20

Analyte	Accuracy Criteria (Soil)	Maximum RPD (%)
Benzo(g,h,i)perylene	49-127%	20
Benzo(k)fluoranthene	56-123%	20
Chrysene	57-118%	20
Dibenz(a,h)anthracene	50-129%	20
Fluoranthene	55-119%	20
Fluorene	47-114%	20
Indeno(1,2,3-cd)pyrene	49-130%	20
Naphthalene	38-111%	20
Phenanthrene	49-113%	20
Pyrene	55-117%	20
Surrogates		
2-Fluorobiphenyl	46-115%	NA
Nitrobenzene-d ₅	44-125%	NA
Terphenyl-d ₁₄	58-133%	NA

PAHS BY GC/MS-SIM

General

The PAH portion of this SDG consisted of three (3) incremental soil samples, one set of MS/MSD and one set of field triplicates. The samples were collected on March 15, 2017 and were analyzed for PAHs as specified in the UFP-QAPP.

The PAH analyses were performed with USEPA SW846 Method 8270D with SIM detector. All samples in this SDG were analyzed following the procedures outlined in the laboratory Standard Operation Procedure (SOP). All samples were prepared and analyzed undiluted within the holding time required by the method.

The PAH analyses were performed in two analytical batches (#64340 for the original run and #64416 for the confirmation run of one sample) under two sets of initial calibration (ICAL).

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS) and the surrogate spikes. Sample OBOD1-AU02-SS-01 was designated as the parent sample for the MS/MSD analyses on the chain-of-custody.

All LCS recoveries were within acceptance criteria.

The non-compliant MS/MSD recoveries are listed below:

OBOD1-AU02-SS-01

Analytes	MS, %R	MSD, %R	Acceptance Criteria, %R
Dibenzo(a,h)anthracene	47	47	50-129
Pyrene	54	54	55-117

“J” flag was applied to the parent sample result of these two compounds.

Surrogate, Terphenyl-d₁₄, was recovered low in the following samples: method blank, LCS, all field samples except OBOD1-AU01-SS-02. The other two surrogates in all lab QC samples and field samples had compliant %Rs. No flags were applied.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the MS/MSD concentrations and relative standard deviation (RSD) of the results from the field triplicates.

All %RPDs of the MS/MSD were compliant.

There were no PAHs detected at or above the LOQ with all three field triplicate samples, therefore, the %RSD calculation was not performed.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the UFP-QAPP;
- Comparing actual analytical procedures to those described in the UFP-QAPP;
- Evaluating holding times; and
- Examining the laboratory blank for cross contamination of samples during sample analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method and the UFP-QAPP.

- All initial calibration criteria were met.
- All secondary source verification criteria were met. Initial calibration verification (ICV) sample was prepared with secondary source standard.
- All instrument performance check criteria were met.
- All initial and continuing calibration verification criteria were met
- All internal standard criteria were met.
- The Limits of Detection were verified quarterly per DoD QSM version 5.0.

One method blank was associated with this SDG. This blank was free of PAHs at $\frac{1}{2}$ of the LOQ.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All PAH results for the samples in this SDG were considered usable. Thus, the completeness for the PAH portion of this SDG is 100%, which meets the minimum acceptance criterion of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. The field and laboratory quality control samples and evaluated criteria included field triplicates, method blank, laboratory control spike sample, matrix spike/matrix spike duplicate and surrogates. Level IV data package was evaluated including all instrument print-outs. The validated data indicated that the laboratory correctly performed the analyses. Based on the data quality assessment, none of the data were qualified as rejected.

All calculations were spot checked and verified. All data in this SDG are considered usable for the purposes of this project. All sample LODs and LOQs met the requirements listed in the approved site specific UFP-QAPP except all PAH limits were reduced to half since the issuing of the project UFP QAPP. All Method Quality Objectives have been met.



Field QC Assignments and Associated Samples

EDD File Name: FA42100

eQapp Name: FortBliss Accutest

Associated Samples	Sample Collection Date
Field QC OBOD1-AU01-SS-01	
QC Type: Field Triplicate	
OBOD1-AU01-SS-02	3/15/2017 11:15:00 AM
OBOD1-AU01-SS-03	3/15/2017 11:15:00 AM



History of Manual Changes to Automated Data Review Qualifiers

Changed by:

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OBOD1-AU01-SS-01								
1-METHYLNAPHTHALENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
2-METHYLNAPHTHALENE								
ACENAPHTHENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
ACENAPHTHYLENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
ANTHRACENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(A)ANTHRACENE	8270D-SIM	Initial	0.0034	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 15:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(A)PYRENE	8270D-SIM	Initial	0.0047	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 15:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(B)FLUORANTHENE	8270D-SIM	Initial	0.0084	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 15:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(G,H,I)PERYLENE	8270D-SIM	Initial	0.0042	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 15:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(K)FLUORANTHENE	8270D-SIM	Initial	0.0068	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OBOD1-AU01-SS-01								
CHRYSENE	8270D-SIM	Initial	0.0056	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 15:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
DIBENZ(A,H)ANTHRACENE	8270D-SIM	Initial	0.0068	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
FLUORANTHENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
FLUORENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
INDENO(1,2,3-CD)PYRENE	8270D-SIM	Initial	0.0041	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 15:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
NAPHTHALENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
PHENANTHRENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
PYRENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							

Field Sample ID: OBOD1-AU01-SS-03								
1-METHYLNAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
2-METHYLNAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
ACENAPHTHENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OBOD1-AU01-SS-03								
ACENAPHTHYLENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
ANTHRACENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(A)ANTHRACENE	8270D-SIM	Initial	0.0065	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(A)PYRENE	8270D-SIM	Initial	0.0065	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(B)FLUORANTHENE	8270D-SIM	Initial	0.0060	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(G,H,I)PERYLENE	8270D-SIM	Initial	0.0065	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(K)FLUORANTHENE	8270D-SIM	Initial	0.0065	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
CHRYSENE	8270D-SIM	Initial	0.0038	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
DIBENZ(A,H)ANTHRACENE	8270D-SIM	Initial	0.0065	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
FLUORANTHENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
FLUORENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OBOD1-AU01-SS-03								
INDENO(1,2,3-CD)PYRENE	8270D-SIM	Initial	0.0065	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
NAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
PHENANTHRENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
PYRENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
Field Sample ID: OBOD1-AU02-SS-01								
1-METHYLNAPHTHALENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
2-METHYLNAPHTHALENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
ACENAPHTHENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
ACENAPHTHYLENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
ANTHRACENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(A)ANTHRACENE	8270D-SIM	Initial	0.0068	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(A)PYRENE	8270D-SIM	Initial	0.0068	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OBOD1-AU02-SS-01								
BENZO(B)FLUORANTHENE	8270D-SIM	Initial	0.0058	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(G,H,I)PERYLENE	8270D-SIM	Initial	0.0068	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(K)FLUORANTHENE	8270D-SIM	Initial	0.0068	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
CHRYSENE	8270D-SIM	Initial	0.0038	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
DIBENZ(A,H)ANTHRACENE	8270D-SIM	Initial	0.0068	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
FLUORANTHENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
FLUORENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
INDENO(1,2,3-CD)PYRENE	8270D-SIM	Initial	0.0068	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
NAPHTHALENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
PHENANTHRENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
PYRENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OBOD1-AU03-SS-01								
1-METHYLNAPHTHALENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
2-METHYLNAPHTHALENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
ACENAPHTHENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
ACENAPHTHYLENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
ANTHRACENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(A)ANTHRACENE	8270D-SIM	Initial	0.0045	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(A)PYRENE	8270D-SIM	Initial	0.0056	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(B)FLUORANTHENE	8270D-SIM	Initial	0.010	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(G,H,I)PERYLENE	8270D-SIM	Initial	0.0051	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
BENZO(K)FLUORANTHENE	8270D-SIM	Initial	0.0038	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
CHRYSENE	8270D-SIM	Initial	0.0065	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OBOD1-AU03-SS-01								
DIBENZ(A,H)ANTHRACENE	8270D-SIM	Initial	0.0068	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
FLUORANTHENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
FLUORENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
INDENO(1,2,3-CD)PYRENE	8270D-SIM	Initial	0.0053	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
NAPHTHALENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
PHENANTHRENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							
PYRENE	8270D-SIM	Initial	0.034	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 15:52
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed slightly low; however, the other two surrogates were compliant and data quality was not compromised.							

DATA VALIDATION SUMMARY REPORT
for samples collected from
FORT BLISS OB/OD SITE I and OB SITE II, TEXAS

Data Validation by: Tammy Chang
Date: 6 May, 2017
Parsons - Austin

INTRODUCTION

The following data validation summary report covers five incremental soil samples and associated field quality control (QC) samples collected from OB/OD Site I and OB Site II of Ft. Bliss, Texas on March 15 and 16, 2017. Samples were logged in under the following Sample Delivery Group (SDG):

FA 42152

OB/OD Site I samples were analyzed for metals, explosives, polynuclear aromatic hydrocarbons (PAHs), and pH. OB Site II samples were analyzed for PAHs only. The QC samples involved were two sets of field triplicate samples and one set of matrix spike/matrix spike duplicate (MS/MSD). The table below details the requested parameters for each sample.

Incremental samples were collected by Parsons in plastic bags and shipped to SGS-Accutest, Orlando, FL in one cooler with ice. The cooler was received at 4.4°C.

The chemical analyses were performed following the procedures outlined in the laboratory Subcontract and the project specific Final Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP).

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Explosives, Metals, PAHs & pH	Comments
OBOD1-SU08-SS-01	X	field triplicate
OBOD1-SU08-SS-02	X	field triplicate
OBOD1-SU08-SS-03	X	field triplicate
OB2-SU01-SS-01	PAH only	field triplicate
OB2-SU01-SS-02	PAH only	field triplicate
OB2-SU01-SS-03	PAH only	field triplicate
OB2-SU02-SS-01	PAH only	
OB2-SU03-SS-01	PAH only	MS/MSD
OBOD1-SU09-SS-01	X	

EXTRACTION AND ANALYTICAL METHODS:

PARAMETER	MATRIX	EXTRACTION METHOD	ANALYTICAL METHOD	UNITS	DRY WT. VS. WET WT
Metals	S	3050B	6010C	mg/kg	Dry Wt.
Explosives	S	8330B	8330B	mg/kg	Dry Wt.
PAH	S	3550B	8270D-SIM	mg/kg	Dry Wt.
pH	S	NA	9045D	NA	NA

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project specific UFP-QAPP. Information reviewed in the data packages included sample results; field and laboratory quality control results; calibrations; case narratives; raw data; cooler receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the UFP-QAPP were met.

Electronic data deliverable (EDD) software, Automatic Data Review (ADR), rules were applied for flagging the data as follows: If an analyte was detected in the method blank, the associated sample concentrations were examined. If the analyte was detected in a sample at a concentration similar to the concentration found in the blank (five times the blank concentration for most analytes, or ten times the blank concentration for common laboratory contaminants), sample results for that analyte which were less than the Limit of Quantitation (LOQ) were raised to the LOQ value and flagged "U", and sample results for that analyte which were greater than the LOQ were reported at the concentration found and flagged "U" for that particular sample.

SGS-Accutest reported the non-detect results in accordance with the requirements established in Department of Defense (DoD) Quality System Manual (QSM) version 5.0. For example, when the analysis demonstrates a non-detect at the Detection Limit (DL), the data was reported with the value of Limit of Detection (LOD) and flagged with a "U". Any results between LOQ and DL were reported with "J" flag.

Due to limitations in their LIMS reporting system, Accutest reported using internal laboratory spike tolerances and listed exceedances of DoD QSM limits in the report footnotes. DoD QSM limits listed below were used for data validation.

Analyte	Accuracy Criteria (Soil)	Maximum RPD (%)
HMX	74-124%	20
RDX	67-129%	20
1,3,5-Trinitrobenzene	80-116%	20
1,3-Dinitrobenzene	73-119%	20
Nitrobenzene	67-129%	20

Analyte	Accuracy Criteria (Soil)	Maximum RPD (%)
Tetryl	68-135%	20
Nitroglycerin	73-124%	20
2,4,6-Trinitrotoluene	71-120%	20
4-Amino-2,6-dinitrotoluene	64-127%	20
2-Amino-4,6-dinitrotoluene	71-123%	20
2,4-Dinitrotoluene	75-121%	20
2,6-Dinitrotoluene	79-117%	20
3-Nitrotoluene	67-129%	20
PETN	72-128%	20
2-Nitrotoluene	70-124%	20
4-Nitrotoluene	71-124%	20
3,4-Dinitrobenzene (Surrogate)	69-134%	NA

Analyte	Accuracy Criteria (Soil)	Maximum RPD (%)
1-Methylnaphthalene	43-111%	20
2-Methylnaphthalene	39-114%	20
Acenaphthene	44-111%	20
Acenaphthylene	39-116%	20
Anthracene	50-114%	20
Benz(a)anthracene	54-122%	20
Benz(a)pyrene	50-125%	20
Benzo(b)fluoranthene	53-128%	20
Benzo(g,h,i)perylene	49-127%	20
Benzo(k)fluoranthene	56-123%	20
Chrysene	57-118%	20
Dibenz(a,h)anthracene	50-129%	20
Fluoranthene	55-119%	20
Fluorene	47-114%	20
Indeno(1,2,3-cd)pyrene	49-130%	20

Analyte	Accuracy Criteria (Soil)	Maximum RPD (%)
Naphthalene	38-111%	20
Phenanthrene	49-113%	20
Pyrene	55-117%	20
Surrogates		
2-Fluorobiphenyl	46-115%	NA
Nitrobenzene-d ₅	44-125%	NA
Terphenyl-d ₁₄	58-133%	NA

Metal	Accuracy Criteria (Soil)	Maximum RPD (%)
Aluminum	74-119%	20
Antimony	79-114%	20
Copper	81-117%	20
Lead	81-112%	20
Zinc	82-113%	20

PAHS BY GC/MS-SIM

General

The PAH portion of this SDG consisted of five (5) incremental soil samples, two (2) sets of field triplicate and one (1) set of MS/MSD. The samples were collected on March 15 and 16, 2017 and were analyzed for PAHs as specified in the UFP-QAPP.

The PAH analyses were performed with USEPA SW846 Method 8270D with SIM detector. All samples in this SDG were analyzed following the procedures outlined in the laboratory Standard Operation Procedure (SOP). All samples were prepared and analyzed undiluted within the holding time required by the method.

The PAH analyses were performed in one analytical batch (#64367) under one set of initial calibration (ICAL).

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from laboratory control sample (LCS), MS/MSD, and the surrogate spikes. Sample OB2-SU03-SS-01 was designated as the parent sample for the MS/MSD analyses on the chain-of-custody.

All LCS recoveries were within acceptance criteria. Surrogate Terphenyl-d₁₄ had %R less than the control limit in the first six samples listed in the table of the previous page. No flags were applied since the other two surrogates had acceptable %Rs.

The MS/MSD recoveries for the soil batch were compliant.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the MS/MSD concentrations and relative standard deviation (RSD) of the two sets of field triplicates. Samples OBOD1-SU08-SS-01 and OB2-SU01-SS were both collected in triplicate.

All %RPDs of the MS/MSD were compliant.

None of the target PAHs were detected greater than the LOQs in both sets of field triplicates, therefore, the RSD calculation was not applicable.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the UFP-QAPP;
- Comparing actual analytical procedures to those described in the UFP-QAPP;
- Evaluating holding times; and
- Examining the laboratory blank for cross contamination of samples during sample analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method and the UFP-QAPP.

- All initial calibration criteria were met.
- All secondary source verification criteria were met. Initial calibration verification sample was prepared with the secondary source standard.
- All instrument performance check criteria were met.
- All initial and continuing calibration verification criteria were met
- All internal standard criteria were met.
- The Limits of Detection were verified quarterly per DoD QSM version 5.0.

There was one method blank associated with this SDG. The blank was free of PAHs at $\frac{1}{2}$ of the LOQ.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All PAH results for the samples in this SDG were considered usable. Thus, the completeness for the PAH portion of this SDG is 100%, which meets the minimum acceptance criterion of 90%.

EXPLOSIVES

General

The explosives portion of this SDG consisted of two (2) soil samples and set of field triplicate samples. The samples were collected on March 15 and 16, 2017 and were analyzed for the full list of explosives as specified in the UFP-QAPP.

The explosives analyses were performed per the United States Environmental Protection Agency (USEPA) SW846 Method 8330B. Standard reference material (SRM) was used for the analysis.

The explosives samples were extracted in one analytical batch, #64396. The samples were analyzed under one set of initial calibration (ICAL) curves, one for each column. Since none of the target explosives were detected in the field sample, no confirmation run was needed.

Accuracy

Accuracy was evaluated using %R obtained from the LCS, one SRM, MS/MSD, and the surrogate spikes. Lab used sample OBOD1-SU08-SS-01 as the parent sample for the MS/MSD analyses.

All %Rs of the LCS were compliant.

All non-compliant %Rs of the MS/MSD are listed below:

OBOD1-SU08-SS-01

Analyte	MS, %R	MSD, %R	Acceptance Criteria, %R
Tetryl	143	146	68-135
1,3,5-Trinitrobenzene	68	69	80-116
2,4,6-Trinitrotoluene	123	124	71-120

Since the parent sample had no detection of the above listed three compounds, a "J" flag was applied for low %R only to the 1,3,5-Trinitrobenzene results of the parent sample and associated triplicates.

For the SRM, Tetryl, 4-Amino-2,6-Dinitrotoluene and 2,4,6-Trinitrotoluene were recovered lower than the DoD QSM criteria. "J" flags were applied to the results of these three compounds of all samples in this SDG.

Surrogate was not spiked in the SRM sample by mistake. All other surrogate %Rs were compliant.

Precision

Precision was evaluated using the RPD obtained from the MS/MSD concentrations and relative standard deviation (RSD) of the field triplicate analyses with sample OBOD1-SU08-SS-01.

All RPDs of the MS/MSD results were compliant.

None of the target explosives were detected in the field triplicate samples, therefore, the RSD calculation was not applicable.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the UFP-QAPP;
- Comparing actual analytical procedures to those described in the UFP-QAPP;
- Evaluating holding times; and
- Examining laboratory and field blanks for cross contamination of samples during sample collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method and the UFP-QAPP.

- All initial calibration was compliant.
- All initial calibration verification (ICV) samples were prepared with secondary source standards and criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- The limits of detection (LODs) were verified quarterly per DoD Quality System Manual (QSM) version 5.0 requirements.

There and one method blank involved in the explosives analyses in this SDG. Results of the method blank were compliant.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All explosive results for the samples in this SDG were considered usable. The completeness for the explosives portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

METALS

General

The metals portion of this SDG consisted of two (2) soil samples one (1) set of field triplicate samples. The samples were collected on March 15 and 16, 2017. All samples were analyzed for aluminum, antimony, copper, lead and zinc.

The metals analyses were performed using USEPA SW846 Method 6010C. The samples were analyzed following the procedures outlined in the UFP-QAPP.

All samples were prepared and analyzed within the holding time required by the method and the UFP-QAPP. All digestates were run undiluted.

The samples for metals analyses were digested in one analytical batch, #31871. All samples were analyzed in one injection batch.

Accuracy

Accuracy was evaluated using the %Rs obtained from the LCS. The lab used a sample from another SDG for the MS/MSD analyses. Results of MS/MSD were not evaluated.

All LCS recoveries were within acceptance criteria.

Precision

Precision was evaluated based on the RSD of the field triplicate results where all three values are greater than LOQs.

OBOD1-SU08-SS-

Metals	-01, mg/kg	-02, mg/kg	-03, mg/kg	%RSD	Criteria, %RSD
Aluminum	4,130	4,060	3,950	2.2	≤ 50
Copper	6.3	5.8	5.9	4.4	≤ 50
Lead	9.4	8.9	9.5	3.5	≤ 50
Zinc	15.3	14.8	14.7	2.2	≤ 50

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the UFP-QAPP;
- Comparing actual analytical procedures to those described in the UFP-QAPP;
- Evaluating preservation and holding times; and
- Examining laboratory blanks and EB for cross contamination of samples during sample collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the UFP-QAPP. The samples were prepared and analyzed within the holding times required by the method.

- All instrument initial calibration criteria were met.

- All metals met criteria in the low-level check standard.
- All second source criteria were met. The ICVs were prepared using a secondary source.
- All CCV criteria were met.
- All interference check (ICSA/ICSAB) criteria were met.
- The dilution test and post-digestion spike analyses were performed with sample from another SDG. Results were not reviewed.
- The LODs were verified quarterly according to the DoD QSM version 5.0 requirements.

There was one method blank and several calibration blanks associated with the metals analyses in this SDG. All results were compliant.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All metal results for the samples in this SDG were considered usable. Therefore, the completeness for the metal portion of this SDG is 100%, which meets the minimum acceptance criterion of 90%.

pH

All samples were analyzed for pH by method SW9045D 15 days after sample receipt. Parsons project chemist requested lab to make sure the holding time of "ASAP" needs to be entered in the lab information management system for any future projects/samples.

The pH meter was calibrated with pH buffer solution of 4, 7, and 10. The CCV was performed with the same three buffer solution.

The lab duplicate was performed with sample OBOD1-SU08-SS-01. The pH readings were 8.18 and 8.15, respectively. This met the precision requirement that the parent and duplicate sample be within 0.05 units of each other.

Field triplicate had pH readings of 8.18, 8.22, and 8.22.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. The field and laboratory quality control samples and evaluated criteria included analytical

duplicates, method blanks, laboratory control spike samples, matrix spike/matrix spike duplicate and surrogates. Level IV data package was evaluated including all instrument print-outs. The validated data indicated that the laboratory correctly performed the analyses. Based on the data quality assessment, none of the data were qualified as rejected.

All calculations were spot checked and verified. All data in this SDG are considered usable for the purposes of this project. All sample LODs and LOQs met the requirements listed in the approved site specific UFP-QAPP except all PAH limits were reduced to half since the issuing of the project UFP QAPP. All Method Quality Objectives have been met.



Field QC Assignments and Associated Samples

EDD File Name: FA42152

eQapp Name: FortBliss Accutest

Associated Samples	Sample Collection Date
Field QC OB2-SU01-SS-01	
QC Type: Field Triplicate	
OB2-SU01-SS-03	3/16/2017 8:30:00 AM
OB2-SU01-SS-02	3/16/2017 8:30:00 AM
Field QC OBOD1-SU08-SS-01	
QC Type: Field Triplicate	
OBOD1-SU08-SS-02	3/15/2017 9:00:00 AM
OBOD1-SU08-SS-03	3/15/2017 9:00:00 AM



History of Manual Changes to Automated Data Review Qualifiers

Changed by:

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OB2-SU01-SS-01								
1-METHYLNAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
2-METHYLNAPHTHALENE								
ACENAPHTHENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
ACENAPHTHYLENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
ANTHRACENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(A)ANTHRACENE	8270D-SIM	Initial	0.0035	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(A)PYRENE	8270D-SIM	Initial	0.0046	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(B)FLUORANTHENE	8270D-SIM	Initial	0.0080	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(G,H,I)PERYLENE	8270D-SIM	Initial	0.0043	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(K)FLUORANTHENE	8270D-SIM	Initial	0.0066	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OB2-SU01-SS-01								
CHRYSENE	8270D-SIM	Initial	0.0055	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
DIBENZ(A,H)ANTHRACENE	8270D-SIM	Initial	0.0066	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
FLUORANTHENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
FLUORENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
INDENO(1,2,3-CD)PYRENE	8270D-SIM	Initial	0.0048	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
NAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
PHENANTHRENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
PYRENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							

Field Sample ID: OB2-SU01-SS-02

1-METHYLNAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
2-METHYLNAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
ACENAPHTHENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OB2-SU01-SS-02								
ACENAPHTHYLENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
ANTHRACENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(A)ANTHRACENE	8270D-SIM	Initial	0.0067	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(A)PYRENE	8270D-SIM	Initial	0.0042	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(B)FLUORANTHENE	8270D-SIM	Initial	0.0073	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(G,H,I)PERYLENE	8270D-SIM	Initial	0.0036	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(K)FLUORANTHENE	8270D-SIM	Initial	0.0067	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
CHRYSENE	8270D-SIM	Initial	0.0046	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
DIBENZ(A,H)ANTHRACENE	8270D-SIM	Initial	0.0067	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
FLUORANTHENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
FLUORENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OB2-SU01-SS-02								
INDENO(1,2,3-CD)PYRENE	8270D-SIM	Initial	0.0036	mg/Kg	Surrogate/Tracer Recovery Low J			5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
NAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low UJ			5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
PHENANTHRENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low UJ			5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
PYRENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low UJ			5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
Field Sample ID: OB2-SU01-SS-03								
1-METHYLNAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low UJ			5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
2-METHYLNAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low UJ			5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
ACENAPHTHENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low UJ			5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
ACENAPHTHYLENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low UJ			5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
ANTHRACENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low UJ			5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(A)ANTHRACENE	8270D-SIM	Initial	0.0067	mg/Kg	Surrogate/Tracer Recovery Low UJ			5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(A)PYRENE	8270D-SIM	Initial	0.0038	mg/Kg	Surrogate/Tracer Recovery Low J			5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OB2-SU01-SS-03								
BENZO(B)FLUORANTHENE	8270D-SIM	Initial	0.0066	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(G,H,I)PERYLENE	8270D-SIM	Initial	0.0034	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(K)FLUORANTHENE	8270D-SIM	Initial	0.0067	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
CHRYSENE	8270D-SIM	Initial	0.0045	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
DIBENZ(A,H)ANTHRACENE	8270D-SIM	Initial	0.0067	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
FLUORANTHENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
FLUORENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
INDENO(1,2,3-CD)PYRENE	8270D-SIM	Initial	0.0037	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
NAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
PHENANTHRENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
PYRENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OBOD1-SU08-SS-01								
1-METHYLNAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
2-METHYLNAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
ACENAPHTHENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
ACENAPHTHYLENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
ANTHRACENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(A)ANTHRACENE	8270D-SIM	Initial	0.0067	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(A)PYRENE	8270D-SIM	Initial	0.0067	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(B)FLUORANTHENE	8270D-SIM	Initial	0.0044	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(G,H,I)PERYLENE	8270D-SIM	Initial	0.0067	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(K)FLUORANTHENE	8270D-SIM	Initial	0.0067	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
CHRYSENE	8270D-SIM	Initial	0.0067	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OBOD1-SU08-SS-01								
DIBENZ(A,H)ANTHRACENE	8270D-SIM	Initial	0.0067	mg/Kg	Surrogate/Tracer Recovery Low< UJ			5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
FLUORANTHENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low< UJ			5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
FLUORENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low< UJ			5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
INDENO(1,2,3-CD)PYRENE	8270D-SIM	Initial	0.0067	mg/Kg	Surrogate/Tracer Recovery Low< UJ			5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
NAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low< UJ			5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
PHENANTHRENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low< UJ			5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
PYRENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low< UJ			5/11/2017 16:50
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
Field Sample ID: OBOD1-SU08-SS-02								
1,3,5-TRINITROBENZENE	8330B	Initial	0.075	mg/Kg	Matrix Spike Lower Estimation	UJ		5/11/2017 17:14
Reason for change:	Flagged UJ as estimated due to the low MS/MSD recoveries in the MS/MSD derived from parent sample OBOD1-SU08-SS-01.							
1-METHYLNAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low< UJ			5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
2-METHYLNAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low< UJ			5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
ACENAPHTHENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low< UJ			5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OBOD1-SU08-SS-02								
ACENAPHTHYLENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
ANTHRACENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(A)ANTHRACENE	8270D-SIM	Initial	0.0066	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(A)PYRENE	8270D-SIM	Initial	0.0066	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(B)FLUORANTHENE	8270D-SIM	Initial	0.0035	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(G,H,I)PERYLENE	8270D-SIM	Initial	0.0066	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(K)FLUORANTHENE	8270D-SIM	Initial	0.0066	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
CHRYSENE	8270D-SIM	Initial	0.0066	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
DIBENZ(A,H)ANTHRACENE	8270D-SIM	Initial	0.0066	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
FLUORANTHENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
FLUORENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OBOD1-SU08-SS-02								
INDENO(1,2,3-CD)PYRENE	8270D-SIM	Initial	0.0066	mg/Kg	Surrogate/Tracer Recovery Low< UJ		5/11/2017 16:51	
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
NAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low< UJ		5/11/2017 16:51	
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
PHENANTHRENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low< UJ		5/11/2017 16:51	
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
PYRENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low< UJ		5/11/2017 16:51	
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
Field Sample ID: OBOD1-SU08-SS-03								
1,3,5-TRINITROBENZENE	8330B	Initial	0.075	mg/Kg	Matrix Spike Lower Estimation	UJ	5/11/2017 17:14	
Reason for change:	Flagged UJ as estimated due to the low MS/MSD recoveries in the MS/MSD derived from parent sample OBOD1-SU08-SS-01.							
1-METHYLNAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low< UJ		5/11/2017 16:51	
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
2-METHYLNAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low< UJ		5/11/2017 16:51	
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
ACENAPHTHENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low< UJ		5/11/2017 16:51	
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
ACENAPHTHYLENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low< UJ		5/11/2017 16:51	
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
ANTHRACENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low< UJ		5/11/2017 16:51	
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(A)ANTHRACENE	8270D-SIM	Initial	0.0066	mg/Kg	Surrogate/Tracer Recovery Low< UJ		5/11/2017 16:51	
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OBOD1-SU08-SS-03								
BENZO(A)PYRENE	8270D-SIM	Initial	0.0066	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(B)FLUORANTHENE	8270D-SIM	Initial	0.0038	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(G,H,I)PERYLENE	8270D-SIM	Initial	0.0066	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
BENZO(K)FLUORANTHENE	8270D-SIM	Initial	0.0039	mg/Kg	Surrogate/Tracer Recovery Low	J		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
CHRYSENE	8270D-SIM	Initial	0.0066	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
DIBENZ(A,H)ANTHRACENE	8270D-SIM	Initial	0.0066	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
FLUORANTHENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
FLUORENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
INDENO(1,2,3-CD)PYRENE	8270D-SIM	Initial	0.0066	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
NAPHTHALENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							
PHENANTHRENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change:	No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.							

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OBOD1-SU08-SS-03								
PYRENE	8270D-SIM	Initial	0.033	mg/Kg	Surrogate/Tracer Recovery Low	UJ		5/11/2017 16:51
Reason for change: No corrective action necessary. Surrogate Terphenyl-d14 failed low; however, the other two surrogates were compliant so data quality was not compromised.								

DATA VALIDATION SUMMARY REPORT
for samples collected from
FORT BLISS OB SITE II, TEXAS

Data Validation by: Tammy Chang
Date: 6 May, 2017
Parsons - Austin

INTRODUCTION

The following data validation summary report covers three incremental soil samples and associated field quality control (QC) samples collected from OB Site II of Ft. Bliss, Texas on April 5, 2017. Samples were logged in under the following Sample Delivery Group (SDG):

FA 42817

All samples were analyzed for metals, explosives, and pH. The QC samples involved were one set of field triplicate samples and one set of matrix spike/matrix spike duplicate (MS/MSD). The table below details the requested parameters for each sample.

Incremental samples were collected by Parsons in plastic bags and shipped to SGS-Accutest, Orlando, FL in one cooler with ice. The cooler was received at 3.0°C.

The chemical analyses were performed following the procedures outlined in the laboratory Subcontract and the project specific Final Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP).

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Explosives, Metals, & pH	Comments
OB2-SU01-SS-01	X	field triplicate
OB2-SU01-SS-02	X	field triplicate
OB2-SU01-SS-03	X	field triplicate
OB2-SU02-SS-01	X	
OB2-SU03-SS-01	X	MS/MSD

EXTRACTION AND ANALYTICAL METHODS:

PARAMETER	MATRIX	EXTRACTION METHOD	ANALYTICAL METHOD	UNITS	DRY WT. VS. WET WT
Metals	S	3050B	6010C	mg/kg	Dry Wt.
Explosives	S	8330B	8330B	mg/kg	Dry Wt.
PAH	S	3550B	8270D-SIM	mg/kg	Dry Wt.
pH	S	NA	9045D	NA	NA

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project specific UFP-QAPP. Information reviewed in the data packages included sample results; field and laboratory quality control results; calibrations; case narratives; raw data; cooler receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the UFP-QAPP were met.

Electronic data deliverable (EDD) software, Automatic Data Review (ADR), rules were applied for flagging the data as follows: If an analyte was detected in the method blank, the associated sample concentrations were examined. If the analyte was detected in a sample at a concentration similar to the concentration found in the blank (five times the blank concentration for most analytes, or ten times the blank concentration for common laboratory contaminants), sample results for that analyte which were less than the Limit of Quantitation (LOQ) were raised to the LOQ value and flagged "U", and sample results for that analyte which were greater than the LOQ were reported at the concentration found and flagged "U" for that particular sample.

SGS-Accutest reported the non-detect results in accordance with the requirements established in Department of Defense (DoD) Quality System Manual (QSM) version 5.0. For example, when the analysis demonstrates a non-detect at the Detection Limit (DL), the data was reported with the value of Limit of Detection (LOD) and flagged with a "U". Any results between LOQ and DL were reported with "J" flag.

Due to limitations in their LIMS reporting system, Accutest reported using internal laboratory spike tolerances and listed exceedances of DoD QSM limits in the report footnotes. DoD QSM limits listed below were used for data validation.

Analyte	Accuracy Criteria (Soil)	Maximum RPD (%)
HMX	74-124%	20
RDX	67-129%	20
1,3,5-Trinitrobenzene	80-116%	20
1,3-Dinitrobenzene	73-119%	20
Nitrobenzene	67-129%	20

Analyte	Accuracy Criteria (Soil)	Maximum RPD (%)
Tetryl	68-135%	20
Nitroglycerin	73-124%	20
2,4,6-Trinitrotoluene	71-120%	20
4-Amino-2,6-dinitrotoluene	64-127%	20
2-Amino-4,6-dinitrotoluene	71-123%	20
2,4-Dinitrotoluene	75-121%	20
2,6-Dinitrotoluene	79-117%	20
3-Nitrotoluene	67-129%	20
PETN	72-128%	20
2-Nitrotoluene	70-124%	20
4-Nitrotoluene	71-124%	20
3,4-Dinitrobenzene (Surrogate)	69-134%	NA

Metal	Accuracy Criteria (Soil)	Maximum RPD (%)
Aluminum	74-119%	20
Antimony	79-114%	20
Copper	81-117%	20
Lead	81-112%	20
Zinc	82-113%	20

EXPLOSIVES

General

The explosives portion of this SDG consisted of three (3) soil samples and one set of field triplicate samples. The samples were collected on April 5, 2017 and were analyzed for the full list of explosives as specified in the UFP-QAPP.

The explosives analyses were performed per the United States Environmental Protection Agency (USEPA) SW846 Method 8330B. Standard reference material (SRM) was used for the analysis.

The explosives samples were extracted in one analytical batch, #64710. The samples were analyzed under one set of initial calibration (ICAL) curves, one for each column. Since none of the target explosives were detected in the field sample, no confirmation run was needed.

Accuracy

Accuracy was evaluated using %R obtained from the LCS, one SRM, MS/MSD, and the surrogate spikes. Sample OB2-SU03-SS-01 was designated as the parent sample for the MS/MSD analyses on the chain-of-custody.

All %Rs of the LCS were compliant except PETN had %R greater than the acceptance criteria. Since this compound was not detected in any of the associated field samples flagging was not needed.

All non-compliant %Rs of the MS/MSD are listed below:

OB2-SU03-SS-01

Analyte	MS, %R	MSD, %R	Acceptance Criteria, %R
PETN	186	194	72-128
Nitroglycerin	69	(73)	73-124
2,4,6-Trinitrotoluene	59	61	71-120

() indicate the %R was compliant.

Since the parent sample had no detection of PETN, “UJ” flags were applied only to the Nitroglycerin and 2,4,6-Trinitrotoluene results of the parent sample.

For the SRM, Tetryl and 4-Amino-2,6-Dinitrotoluene were recovered lower than the DoD QSM. “UJ” flags were applied to the results of these two compounds of all samples in this SDG. PETN was recovered higher than the DoD QSM control limit, since PETN was not detected in all associated field samples, flagging was not needed.

Surrogate was not spiked in the SRM sample by mistake.

Precision

Precision was evaluated using the RPD obtained from the MS/MSD concentrations and relative standard deviation (RSD) of the field triplicate analyses with sample OB2-SU01-SS-01.

All RPDs of the MS/MSD results were compliant.

None of the target explosives were detected in the field triplicate samples, therefore, the RSD calculation was not applicable.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the UFP-QAPP;
- Comparing actual analytical procedures to those described in the UFP-QAPP;
- Evaluating holding times; and
- Examining laboratory and field blanks for cross contamination of samples during sample collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method and the UFP-QAPP.

- All initial calibration was compliant.
- All initial calibration verification (ICV) samples were prepared with secondary source standards and criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- The limits of detection (LODs) were verified quarterly per DoD Quality System Manual (QSM) version 5.0 requirements.

There was one method blank involved in the explosives analyses in this SDG. Results of the method blank were compliant.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All explosive results for the samples in this SDG were considered usable. The completeness for the explosives portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

METALS

General

The metals portion of this SDG consisted of three (3) soil samples and one (1) set of field triplicate samples. The samples were collected on April 5, 2017. All samples were analyzed for aluminum, antimony, copper, lead and zinc.

The metals analyses were performed using USEPA SW846 Method 6010C. The samples were analyzed following the procedures outlined in the UFP-QAPP.

All samples were prepared and analyzed within the holding time required by the method and the UFP-QAPP. All digestates were run undiluted.

The samples for metals analyses were digested in one analytical batch, #32025. All samples were analyzed in one injection batch.

Accuracy

Accuracy was evaluated using the %Rs obtained from the LCS, MS and MSD. Sample OB2-SU03-SS-01 was designated as the parent sample for the MS/MSD analyses.

All LCS recoveries were within acceptance criteria.

OB2-SU03-SS-01

Metals	MS, %R	MSD, %R	Acceptance Criteria, %R
Aluminum	(109)	145	74-119

Antimony	30	37	79-114
Zinc	81	(86)	82-113

() indicates %R was compliant.

“J” flag was applied to the aluminum result of the parent sample.

Precision

Precision was evaluated based on the RPD of the MS/MSD results and RSD of the field triplicate results when all three values are greater than LOQs.

OB2-SU01-SS-

Metals	-01, mg/kg	-02, mg/kg	-03, mg/kg	%RSD	Criteria, %RSD
Aluminum	5,420	5,420	4,850	6.3	≤50
Copper	8.7	8.3	7.5	7.5	≤50
Lead	12.4	12.1	12.2	1.2	≤50
Zinc	21.5	21.4	18.6	8.0	≤50

%RPD exceeded the criteria for antimony for the MS/MSD analyses. “J” flag was applied to the parent sample result.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the UFP-QAPP;
- Comparing actual analytical procedures to those described in the UFP-QAPP;
- Evaluating preservation and holding times; and
- Examining laboratory blanks and EB for cross contamination of samples during sample collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the UFP-QAPP. The samples were prepared and analyzed within the holding times required by the method.

- All instrument initial calibration criteria were met.
- All metals met criteria in the low-level check standard.
- All second source criteria were met. The ICVs were prepared using a secondary source.
- All CCV criteria were met.
- All interference check (ICSA/ICSAB) criteria were met.
- The dilution test was performed with sample OB2-SU03-SS-01 and it was only

applicable for aluminum since this metal failed in the MS/MSD analyses and the concentration was >50 times the LOQ. %D was 20% which exceeded the 10% limit.

- The post-digestion spike analysis was performed with sample OB2-SU03-SS-01 and it was applicable for aluminum, antimony, and zinc. Aluminum was flagged “J” due to the non-compliant DT and PDS. PDS %Rs for Antimony and Zinc were compliant so no flags were applied for accuracy non-compliance; however, a “J” flag was applied to antimony for precision exceedance in the MS/MSD RPD as noted above.
- The LODs were verified quarterly according to the DoD QSM version 5.0 requirements.

There was one method blank and several calibration blanks associated with the metals analyses in this SDG. All results were compliant.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All metal results for the samples in this SDG were considered usable. Therefore, the completeness for the metal portion of this SDG is 100%, which meets the minimum acceptance criterion of 90%.

pH

All samples were analyzed for pH by method SW9045D 15 days after sample receipt. Parsons project chemist requested lab to make sure the holding time of “ASAP” needs to be entered in the lab information management system for any future projects/samples.

The pH meter was calibrated with pH buffer solution of 4, 7, and 10. The CCV was performed with the same three buffer solution.

The lab duplicate was performed with sample OBOD1-SU08-SS-01. The pH readings were 8.18 and 8.15, respectively. This met the precision requirement that the parent and duplicate sample be within 0.05 units of each other.

Field triplicate had pH readings of 8.18, 8.22, and 8.22.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. The field and laboratory quality control samples and evaluated criteria included analytical

duplicates, method blanks, laboratory control spike samples, matrix spike/matrix spike duplicate and surrogates. Level IV data package was evaluated including all instrument print-outs. The validated data indicated that the laboratory correctly performed the analyses. Based on the data quality assessment, none of the data were qualified as rejected.

All calculations were spot checked and verified. All data in this SDG are considered usable for the purposes of this project. All sample LODs and LOQs met the requirements listed in the approved site specific UFP-QAPP except all PAH limits were reduced to half since the issuing of the project UFP QAPP. All Method Quality Objectives have been met.



Field QC Assignments and Associated Samples

EDD File Name: FA42817

eQapp Name: FortBliss Accutest

Associated Samples	Sample Collection Date
Field QC OB2-SU01-SS-01	
QC Type: Field Triplicate	
OB2-SU01-SS-02	4/5/2017 10:00:00 AM
OB2-SU01-SS-03	4/5/2017 10:00:00 AM



History of Manual Changes to Automated Data Review Qualifiers

Changed by:

Analyte	Method	Analysis Type	Result	Unit	Reason Code	Original Value	New Value	Edit Time
Field Sample ID: OB2-SU03-SS-01								
ANTIMONY	6010C	Initial	0.066	mg/Kg	Matrix Spike Lower Estimation	J		5/15/2017 12:45
Reason for change: No corrective action necessary for MS/MSD accuracy since the post digestion spike was compliant.								
ANTIMONY	6010C	Initial	0.066	mg/Kg	Laboratory Duplicate Precision	J		5/15/2017 12:57
Reason for change: No corrective action necessary. Sample was already flagged J for MS/MSD RPD exceedance.								
ZINC	6010C	Initial	17.2	mg/Kg	Matrix Spike Lower Estimation	J		5/15/2017 12:45
Reason for change: No corrective action necessary for MS/MSD accuracy since the post digestion spike was compliant.								

APPENDIX F

GEOGRAPHIC INFORMATION SYSTEM DATA

GIS Data are provided in a separate folder / files on this disc.

APPENDIX G
GEOPHYSICAL DATA

March 8, 2017

(b) (6)

Fort Worth District
819 Taylor Street
Fort Worth, TX 76102

Subject: Draft Instrument Verification Strip Report for the Environmental Remediation Services at Four Installation Restoration Program Sites and Military Munitions Program Sites (Biggs Open Burn (OB)/Open Detonation (OD) Site I and OB Site II) at Fort Bliss, Texas.
Contract No. W91ZLK-13-D-0003, Task Order No. 0003

Dear Mr. Kirwan:

The purpose of this letter report is to summarize the results of the instrument verification strip (IVS) data collected at Fort Bliss on March 2, 2017.

INTRODUCTION

Parsons geophysicists established the IVS within the Fort Bliss Biggs Army Air Field (**Figure 1**). On March 2, 2017 Parsons collected background data over the IVS and Parsons personnel buried two small Industry Standard Objects (ISOs) in locations with no pre-existing anomalies. Single sensor EM61-MK2 towed data was collected over the IVS on March 2, 2017. Data analysts compared the measured responses over the test items with expected values to verify that the EM61-MK2 sensor was functioning correctly. They also compared the geophysical anomaly locations with the actual ISO burial locations to confirm the accuracy of the Real Time Kinetic (RTK) global positioning system (GPS). A detailed description of the IVS is given in Section 17.2.7 of the Remedial Investigation at Biggs OB/OD Site I UFP-QAPP and Section 17.2.6 of the Site Inspection at Biggs OB Site II UFP-QAPP. This report contains a summary of the results of the initial IVS testing.

OBJECTIVES

The primary objective of the IVS is to demonstrate that the instrument and data collection strategies selected for the site function as intended for the duration of the field investigation. The objective of the initial IVS test was to verify the adequacy of the anomaly selection threshold and the selected measurement performance criteria (MPCs).

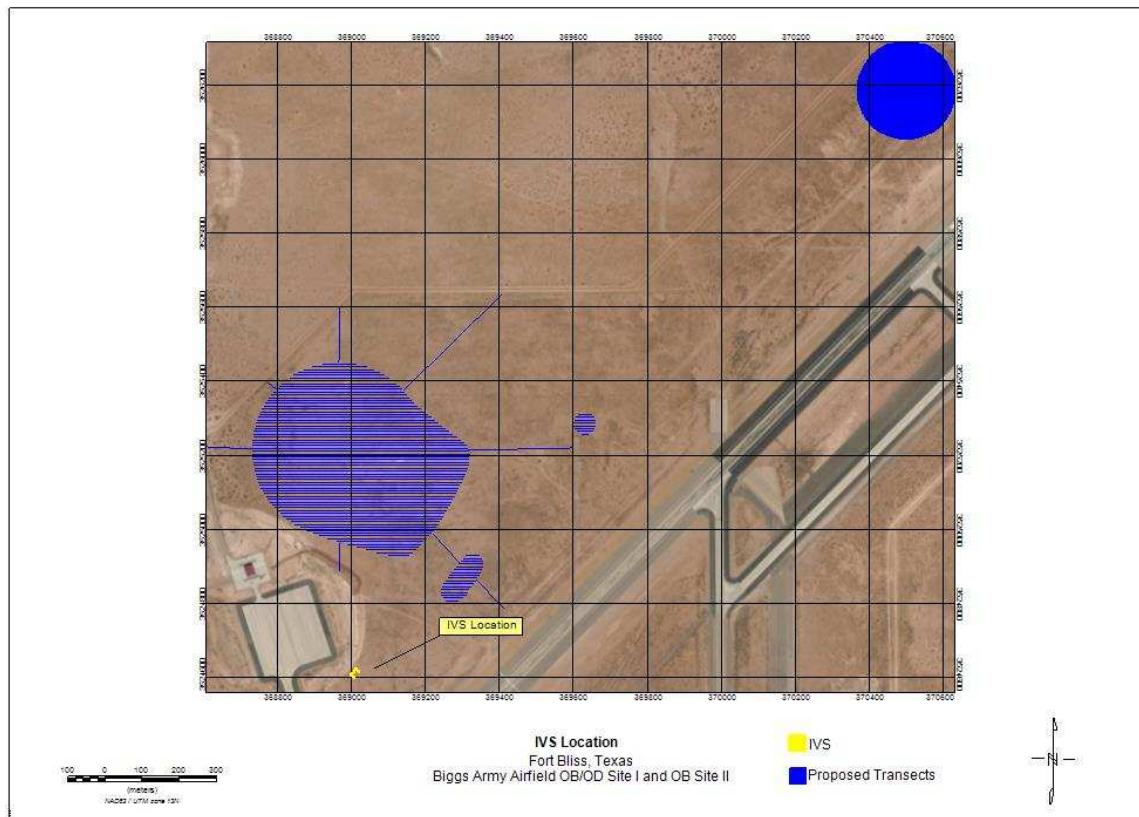


Figure 1: IVS Location.

SURVEY EQUIPMENT

The towed system consists of a utility vehicle, one Geonics EM61-MK2 sensor and a Trimble R10 RTK GPS. The coil is approximately 40cm above the ground surface. The GPS antennae is positioned approximately 0.52 meters in front of the EM61-MK2 coil. **Figure 2** is a photograph of the towed array EM61-MK2 system.



Figure 2. Photograph of the single EM61-MK2 towed array system.

BACKGROUND SURVEYS

The geophysical team collected EM61-MK2 data over the IVS before Parsons buried the ISOs. **Figure 3** displays the background data and selected locations for the IVS items and noise strip. The IVS item locations were selected to avoid pre-existing anomalies.

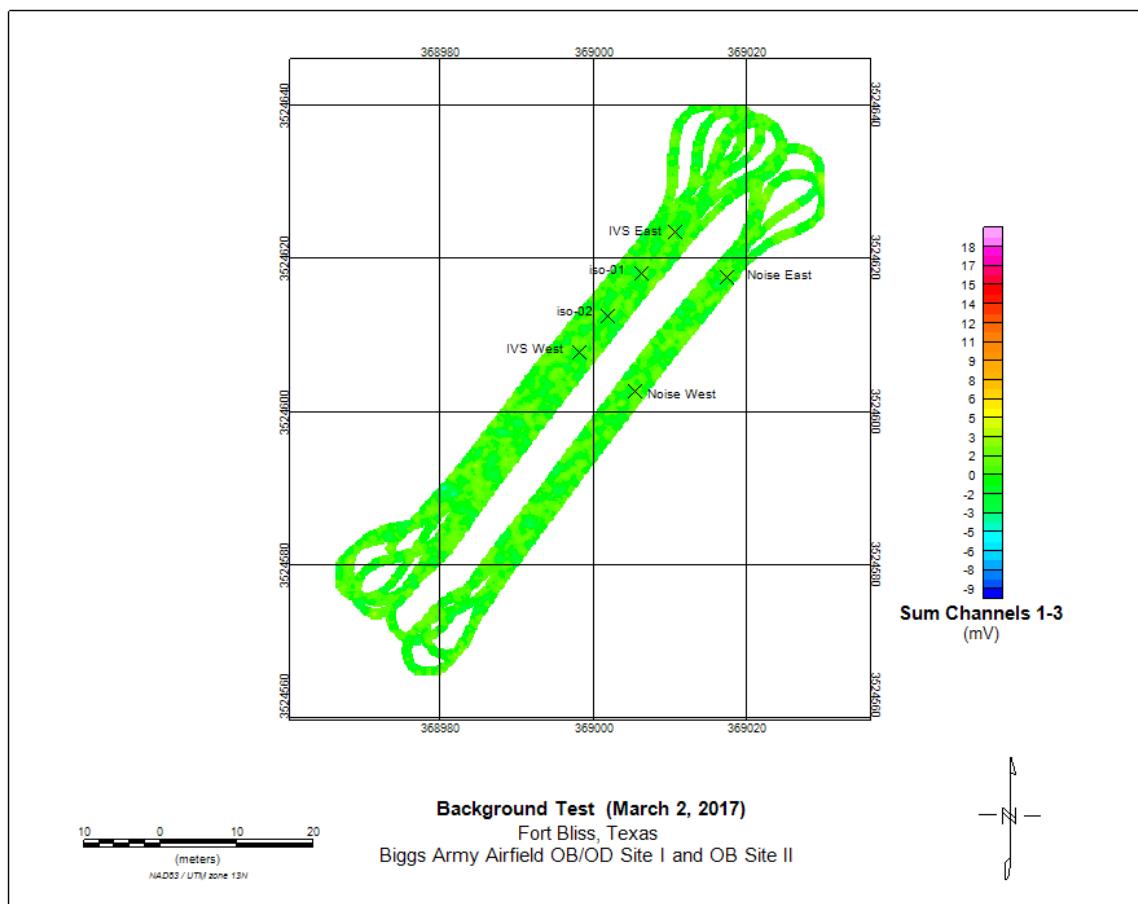


Figure 3. Background EM61-MK2 Data at the IVS.

IVS CONSTRUCTION

Parsons personnel buried two small ISOs along the IVS at the depths and orientations listed in **Table 1**. Depth measurements listed in **Table 1** were measured from the ground surface down to the center of mass of each item. All items were buried in a horizontal position, oriented parallel to the direction of data collection lines. Photographs of each IVS item are included in **Appendix A**.

Table 1.
List of IVS Item Descriptions, Depths, and Orientations

Item	Northing	Easting	Seed Type	Depth (cm)	Inclination	Orientation
IVS East	369010.65	3524623.61	Metal Nail	0	Vertical	NA
ISO-01	369006.31	3524618.17	Small ISO	10	Horizontal	NE
ISO-02	369001.85	3524612.61	Small ISO	23	Horizontal	NE
IVS West	368998.13	3524607.9	Metal Nail	0	Vertical	NA
Noise East	369017.4	3524617.71	Plastic Pin Flag	0	Vertical	NA
Noise West	369005.38	3524602.68	Plastic Pin Flag	0	Vertical	NA

DATA COLLECTION

The single sensor towed data were collected with MagLogNT data acquisition software on a Panasonic Toughbook computer. **Figure 4** and **Table 2** display the towed array EM61-MK2 data and responses measured in the trough of each ISO anomaly. All positions are reported in the project coordinate system, NAD83 UTM Zone 13 North in meters

DATA PROCESSING

All data were imported into Geosoft Oasis Montaj and corrected for latency and drift corrected with a 150-point de-median filter. The leveled channels 1, 2, and 3 were added together to create a sum channel. The sum channel will be used for target selection and for the IVS response results as listed in the UFP-QAPP.

RESULTS

The single sensor towed EM61-MK2A collected data over the IVS and noise lines five times. The average responses of the sensor are listed in **Table 2**. Response profiles of the five IVS lines for each instrument can be found in **Appendix B**. The expected responses will be used for IVS test comparison for this project to confirm that the sensors are functioning correctly.

Table 2.
List of IVS Items and EM61-MK2A Sum Channel Response for Man Portable.

Item	Description	Easting (m)	Northing (m)	Depth (m)	Average Expected Response Sum (mV)	Average Offset (m)
ISO-01	Small ISO	369006.31	3524618.17	0.10	85.41	0.09
ISO-02	Small ISO	369001.85	3524612.61	0.23	26.78	0.06

BACKGROUND NOISE

The Site Geophysicist analyzed the data within the noise test lines located southeast of the seeded test line in the IVS. The noise level was determined by calculating the standard deviation of leveled data from the EM noise test line. The sum channel noise level was 1.04 mV for the single sensor dataset.

ANOMALY THRESHOLD

The anomaly selection threshold is five times the background noise based on the MPC in the UFP-QAPP. With the background noise being 1.04mV the anomaly selection criteria is 5.2mV on the sum channel. Based on the anomaly threshold the depth of detection for the 20mm is 13cm bgs and the 37mm is 47cm bgs.

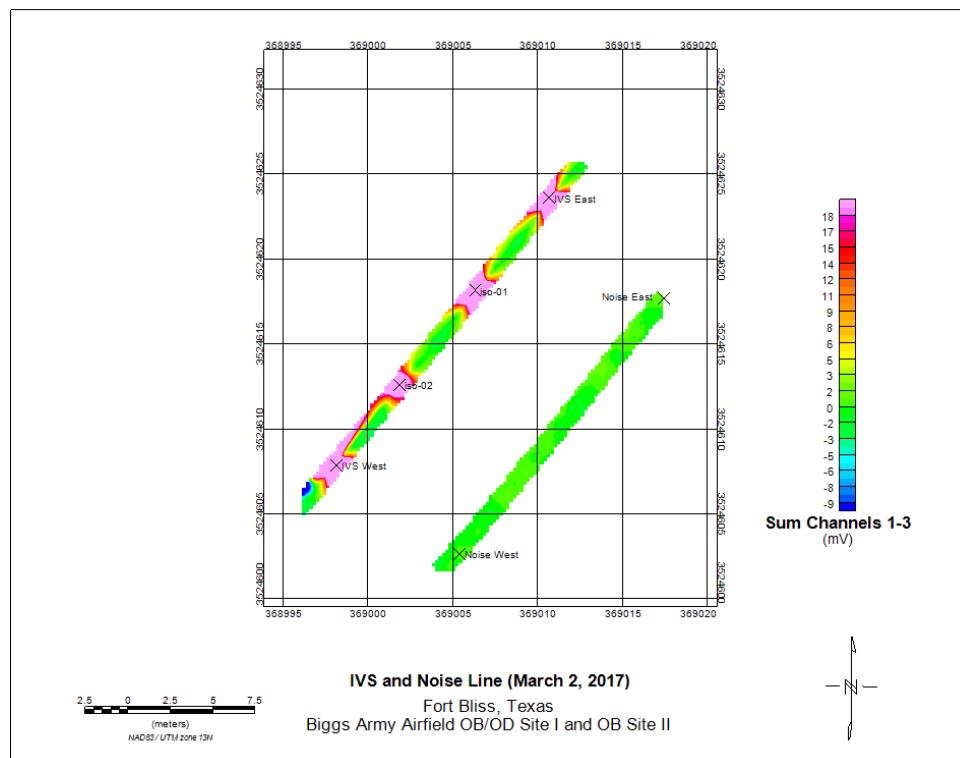


Figure 4. Single Sensor EM61-MK2 data collected over the IVS and noise strip.

MEASUREMENT PERFORMANCE CRITERIA (MPCS)***Static Repeatability***

Static tests were performed with the single EM61-MK2 sensor on March 2, 2017 to establish the expected response from a 3-inch bolt positioned in a jig. The jig was placed near the center of the coil. The response was consistent between 5 tests. **Table 3** lists the responses for each channel and the average of the five tests that will be used for evaluating future single sensor static tests.

Table 3.
Initial Single Sensor Static Test Results.

Test ID	Channel 1 (mV)	Channel 2 (mV)	Channel 3 (mV)	Channel 4 (mV)
03/02/17	580.69	409.94	245.09	120.93
03/02/17	579.45	408.99	244.47	120.55
03/02/17	576.17	406.57	242.91	119.5
03/02/17	575.51	406.11	242.87	119.81
03/02/17	577.44	407.19	243.41	120.09
Average	577.852	407.76	243.75	120.176

Measured responses from all static tests used to establish the expected baseline were within 10% of the expected response, which meets the MPC listed in the UFP-QAPP.

Along-line Measurement Spacing

All IVS datasets contained at least 98% of along-line data spacing less than 0.25m, meeting the MPC listed in the UFP-QAPP.

Velocity

All IVS datasets contained at least 95% below the maximum velocity of 3.4mph, meeting the MPC listed in the UFP-QAPP.

IVS Data Collection

Measured responses from all IVS items are within $\pm 25\%$ of the expected responses. The positions of all ISO anomalies in the IVS were within 0.25m of the actual item positions. Both of these meet the MPC listed in the UFP-QAPP.

CONCLUSIONS

The following conclusions and recommendations are based on the data collected at the IVS and the analysis described above.

- The EM61-MK2 and RTK GPS equipment are functioning correctly.

8000 Centre Park Drive, Suite 200 ♦ Austin, TX 78754 ♦ (512)-719-6855

- The background noise at the site was measured as described above for the EM61-MK2 and was determined to be acceptable for data collection and anomaly detection.
- The IVS was established and will be used for daily verification of equipment functionality throughout the DGM phase of the project.
- The MPCs proposed in the UFP-QAPP (Worksheet #12) were determined to be appropriate and achievable.
- The 5.2 mV selection threshold (sum channel) which is five times the background noise level and does not need to be changed.

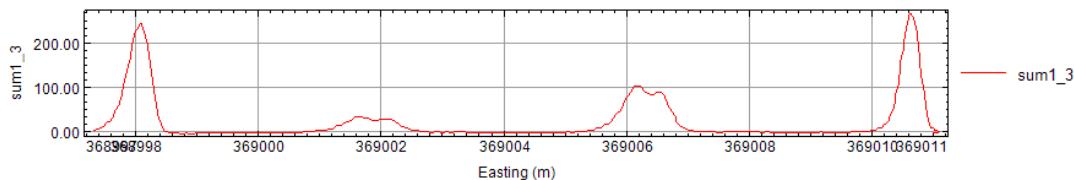
Sincerely,

(b) (6)



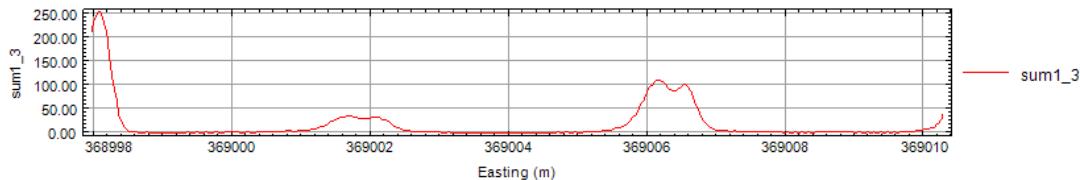
(b) (6)
Project Geophysicist
Parsons

Appendix A: IVS Item Photographs**Figure A-1. Photo of IVS ISO-01.****Figure A-2. Photo of IVS ISO-02.**

Appendix B: IVS Response Profiles**Single Sensor****IVS Line 10 (3/2/2017) Single Sensor Sum1-3 (mV)**

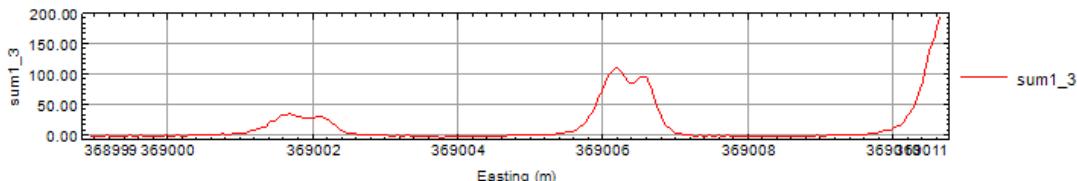
database: c:\Users\p0019655\documents\Bliss\030217_IVS_Static_Tests.gdb_line/group: L10

2017/03/04

IVS Line 12 (3/2/2017) Single Sensor Sum1-3 (mV)

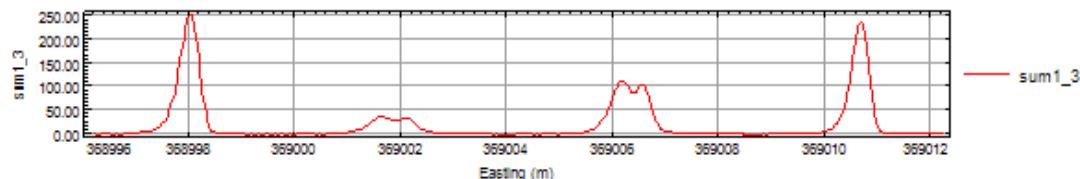
database: c:\Users\p0019655\documents\Bliss\030217_IVS_Static_Tests.gdb_line/group: L12

2017/03/04

IVS Line 14 (3/2/2017) Single Sensor Sum1-3 (mV)

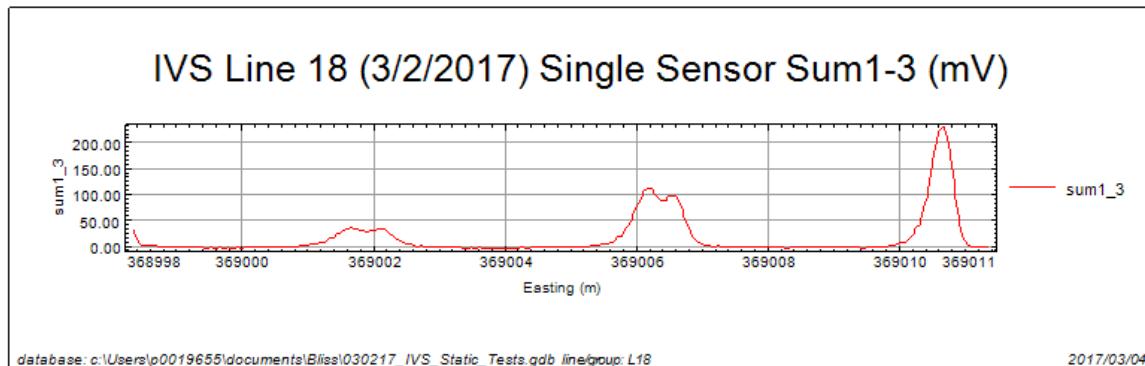
database: c:\Users\p0019655\documents\Bliss\030217_IVS_Static_Tests.gdb_line/group: L14

2017/03/04

IVS Line 16 (3/2/2017) Single Sensor Sum1-3 (mV)

database: c:\Users\p0019655\documents\Bliss\030217_IVS_Static_Tests.gdb_line/group: L16

2017/03/04

**Appendix B: IVS Response Profiles
Continued**

APPENDIX H
CONCEPTUAL SITE MODEL

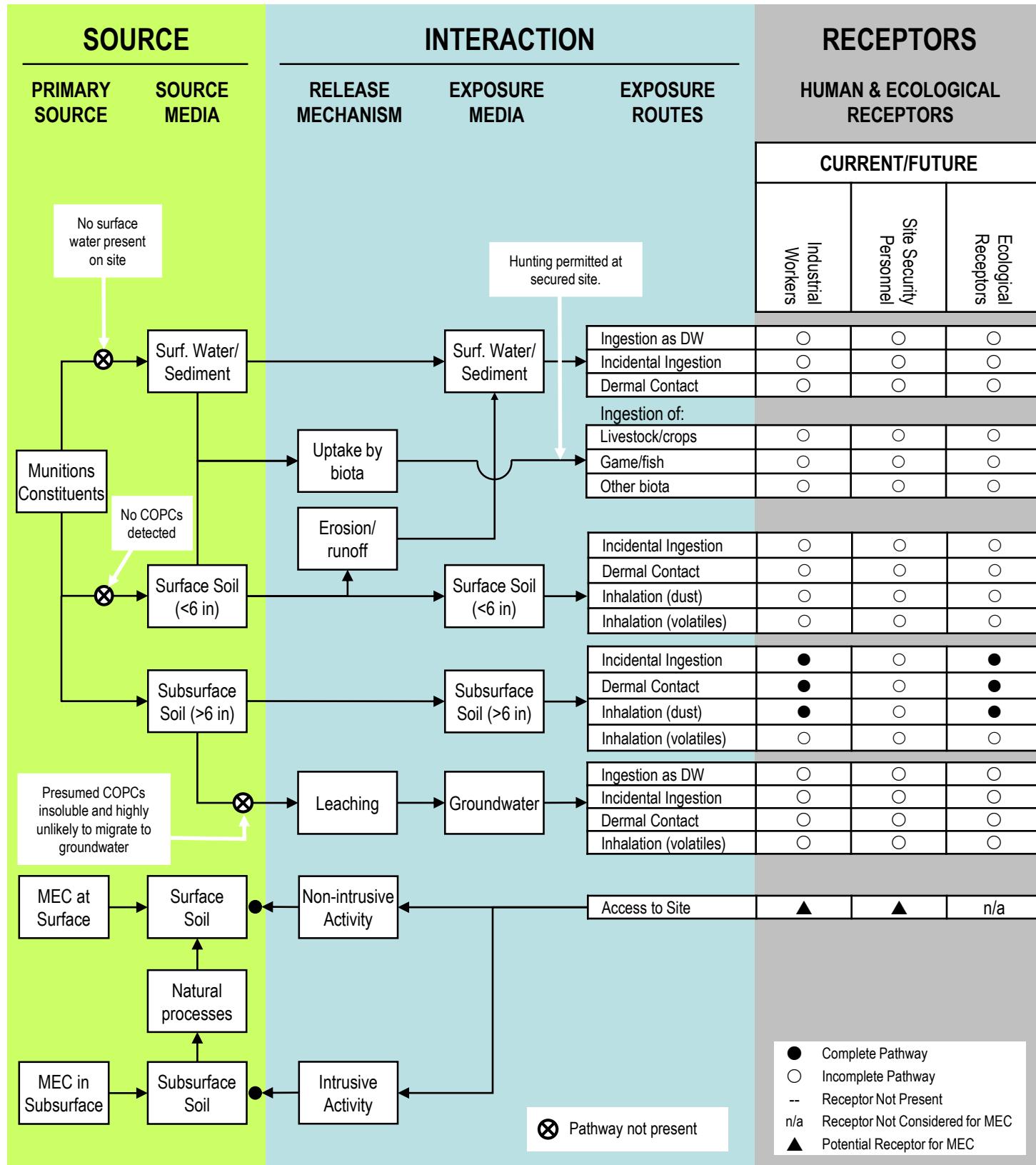
Figure H-1

Revised Conceptual Site Model Pathway Flow Diagram

Site/MRS Name: Fort Bliss- Biggs OB Site II, Fort Bliss, Texas

Completed By: (b) (6)

Date Completed: June 6, 2017



APPENDIX I
MUNITIONS RESPONSE SITE PRIORITIZATION PROTOCOL

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from DoD databases, such as RMIS. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the MRS summary, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental non-munitions related contaminants found at the MRS (e.g., benzene, trichloroethylene), and any potentially exposed human and ecological receptors. Include a map of the MRS, if one is available.

Munitions Response Site Name: Biggs OB Site II

Component: US Army

Installation/Property Name: Fort Bliss

Location (City, County, State): El Paso County, TX

Site Name (RMIS ID)/Project Name (Project No.): FTBLS-006-R-02

Date Information Entered/Updated: 6/23/2017 6:08 PM

Point of Contact (Name/Phone): Robert Rowden, USAEC, (210) 466-1723

Project Phase (check only one):

<input type="checkbox"/> PA	<input checked="" type="checkbox"/> SI	<input type="checkbox"/> RI	<input type="checkbox"/> FS	<input type="checkbox"/> RD
<input type="checkbox"/> RA-C	<input type="checkbox"/> RIP	<input type="checkbox"/> RA-O	<input type="checkbox"/> RC	<input type="checkbox"/> LTM

Media Evaluated (check all that apply):

<input type="checkbox"/> Groundwater	<input type="checkbox"/> Sediment (human receptor)
<input checked="" type="checkbox"/> Surface soil	<input type="checkbox"/> Surface Water (ecological receptor)
<input type="checkbox"/> Sediment (ecological receptor)	<input type="checkbox"/> Surface Water (human receptor)

MRS Summary:

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from DoD databases, such as RMIS. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the MRS summary, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental non-munitions related contaminants found at the MRS (e.g., benzene, trichloroethylene), and any potentially exposed human and ecological receptors. Include a map of the MRS, if one is available.

- *MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM (by type of munition, if known) or munitions constituents (by type, if known) known or suspected to be present:*

There is very little documentation on the history or activities performed at Biggs OB Site II. Based on inference from the history of Biggs Army Airfield, the historical use of the site may date back to the Army during World War II. In September 1947, the property was transferred to the Air Force. In 1948, if in use, activities may have increased when the base was transferred to the US Air Force Strategic Air Command as part of the United States Nuclear Deterrent Force. In 1966, the base was transferred back to the Army.

OB Site II is located approximately 600 feet to the northwest of the main BAAF runway. Based on previous findings, the site is estimated to be approximately 14 acres. The site is fully contained on BAAF property, access is restricted, and the area is secure. There is an access gate to the general area located approximately 1 mile to the west of the site and a dirt road located just north of the runway running parallel with the runway allows for access to this site.

Suspect MEC includes various munitions including 20mm and 37mm projectiles, hand grenades, and small arms ammunition. Potential receptors include industrial workers and site security personnel. There are no MC contaminants that present an unacceptable risk to human health or ecological receptors.

There is no historical basis for the potential of CWM. No physical evidence contradicting this conclusion has been found during SI activities. No analysis for CWM has been performed for any of the media collected during the SI. Therefore, Tables 12-19 are omitted, and the CHE Module is given a rating of "No known or suspected CWM hazard". (Application of MRSPP for the FUDS MMRP SI Program, 3/8/2007 COE Memo.)

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the score(s) that correspond with all munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions*, *small arms*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Sensitive	<ul style="list-style-type: none"> ◆ All UXO that are considered likely to function upon any interaction with exposed persons [e.g., submunitions, 40mm high-explosive (HE) grenades, white phosphorus (WP) munitions, high-explosive antitank (HEAT) munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions]. ◆ All hand grenades containing energetic filler. ◆ Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard. 	30
High explosive (used or damaged)	<ul style="list-style-type: none"> ◆ All UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive." ◆ All DMM containing a high-explosive filler that have: <ul style="list-style-type: none"> ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability. 	25
Pyrotechnic (used or damaged)	<ul style="list-style-type: none"> ◆ All UXO containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades). ◆ All DMM containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades) that have: <ul style="list-style-type: none"> ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability. 	20
High explosive (unused)	<ul style="list-style-type: none"> ◆ All DMM containing a high explosive filler that: <ul style="list-style-type: none"> ▪ Have not been damaged by burning or detonation ▪ Are not deteriorated to the point of instability. 	15
Propellant	<ul style="list-style-type: none"> ◆ All UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). ◆ All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are: <ul style="list-style-type: none"> ▪ Damaged by burning or detonation ▪ Deteriorated to the point of instability. 	15
Bulk secondary high explosives, pyrotechnics, or propellant	<ul style="list-style-type: none"> ◆ All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor), that are deteriorated. ◆ Bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard. 	10
Pyrotechnic (not used or damaged)	<ul style="list-style-type: none"> ◆ All DMM containing a pyrotechnic fillers (i.e., red phosphorous), other than white phosphorous filler, that: <ul style="list-style-type: none"> ▪ Have not been damaged by burning or detonation ▪ Are not deteriorated to the point of instability. 	10
Practice	<ul style="list-style-type: none"> ◆ All UXO that are practice munitions that are not associated with a sensitive fuze. ◆ All DMM that are practice munitions that are not associated with a sensitive fuze and that have not: <ul style="list-style-type: none"> ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability. 	5
Riot control	<ul style="list-style-type: none"> ◆ All UXO or DMM containing a riot control agent filler (e.g., tear gas). 	3
Small arms	<ul style="list-style-type: none"> ◆ All used munitions or DMM that are categorized as small arms ammunition [Physical evidence or historical evidence that no other types of munitions (e.g., grenades, subcaliber training rockets, demolition charges) were used or are present on the MRS is required for selection of this category.] 	2
Evidence of no munitions	<ul style="list-style-type: none"> ◆ Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present. 	0
MUNITIONS TYPE	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 30).	15

DIRECTIONS: Document any MRS-specific data used in selecting the ***Munitions Type*** classifications in the space provided.

Due to the potential use of the site for ordnance disposal, various munitions including 20mm, 37mm and 40 mm projectiles, hand grenades, and small arms ammunition are potentially present in surface and subsurface soil at the MRS. (Subchapter 5.5, 2017 SI Report).

Table 2

EHE Module: Source of Hazard Data Element Table

DIRECTIONS: Below are 11 classifications describing sources of explosive hazards. Circle the score(s) that correspond with all sources of explosive hazards known or suspected to be present at the MRS.

Note: The terms *former range*, *practice munitions*, *small arms*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Former range	<ul style="list-style-type: none"> ◆ The MRS is a former military range where munitions (including practice munitions with sensitive fuzes) have been used. Such areas include: impact or target areas, associated buffer and safety zones, firing points, and live-fire maneuver areas. 	10
Former munitions treatment (i.e., OB/OD) unit	<ul style="list-style-type: none"> ◆ The MRS is a location where UXO or DMM (e.g., munitions, bulk explosives, bulk pyrotechnic, or bulk propellants) were burned or detonated for the purpose of treatment prior to disposal. 	8
Former practice munitions range	<ul style="list-style-type: none"> ◆ The MRS is a former military range on which only practice munitions without sensitive fuzes were used. 	6
Former maneuver area	<ul style="list-style-type: none"> ◆ The MRS is a former maneuver area where no munitions other than flares, simulators, smokes, and blanks were used. There must be evidence that no other munitions were used at the location to place an MRS into this category. 	5
Former burial pit or other disposal area	<ul style="list-style-type: none"> ◆ The MRS is a location where DMM were buried or disposed of (e.g., disposed of into a water body) without prior thermal treatment. 	5
Former industrial operating facilities	<ul style="list-style-type: none"> ◆ The MRS is a location that is a former munitions maintenance, manufacturing, or demilitarization facility. 	4
Former firing points	<ul style="list-style-type: none"> ◆ The MRS is a firing point, where the firing point is delineated as an MRS separate from the rest of a former military range. 	4
Former missile or air defense artillery emplacements	<ul style="list-style-type: none"> ◆ The MRS is a former missile defense or air defense artillery (ADA) emplacement not associated with a military range. 	2
Former storage or transfer points	<ul style="list-style-type: none"> ◆ The MRS is a location where munitions were stored or handled for transfer between different modes of transportation (e.g., rail to truck, truck to weapon system). 	2
Former small arms range	<ul style="list-style-type: none"> ◆ The MRS is a former military range where only small arms ammunition was used [There must be evidence that no other types of munitions (e.g., grenades) were used or are present to place an MRS into this category.] 	1
Evidence of no munitions	<ul style="list-style-type: none"> ◆ Following investigation of the MRS, there is physical evidence that no UXO or DMM are present, or there is historical evidence indicating that no UXO or DMM are present. 	0
SOURCE OF HAZARD	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 10).	8

DIRECTIONS: Document any MRS-specific data used in selecting the **Source of Hazard** classifications in the space provided.

According to the 2013 Memorandum to File (Fort Bliss, 2013), the only visual evidence of possible disposal activities in the 14-acre site boundary is a possible pit and a mound. (Subchapter 2.4, 2017 SI Report).

Table 3
EHE Module: Location of Munitions Data Element Table

DIRECTIONS: Below are eight classifications of munitions locations and their descriptions. Circle the score(s) that correspond with all locations where munitions are located or suspected of being found at the MRS.

Note: The terms *surface*, *subsurface*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Confirmed surface	<ul style="list-style-type: none"> ◆ Physical evidence indicates that there are UXO or DMM on the surface of the MRS ◆ Historical evidence (e.g., a confirmed incident report or accident report) indicates there are UXO or DMM on the surface of the MRS. 	25
Confirmed subsurface, active	<ul style="list-style-type: none"> ◆ Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost, heat heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. ◆ Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost, heat heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. 	20
Confirmed subsurface, stable	<ul style="list-style-type: none"> ◆ Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. ◆ Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. 	15
Suspected (physical evidence)	<ul style="list-style-type: none"> ◆ There is physical evidence (e.g., munitions debris, such fragments, penetrators, projectiles, shell casings, links, fins), other than the documented presence of UXO or DMM, indicating that UXO or DMM may be present at the MRS. 	10
Suspected (historical evidence)	<ul style="list-style-type: none"> ◆ There is historical evidence indicating that UXO or DMM may be present at the MRS. 	5
Subsurface, physical constraint	<ul style="list-style-type: none"> ◆ There is physical or historical evidence indicating that UXO or DMM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the UXO or DMM. 	2
Small arms (regardless of location)	<ul style="list-style-type: none"> ◆ The presence of small arms ammunition is confirmed or suspected, regardless of other factors such as geological stability [There must be evidence that no other types of munitions (e.g., grenades) were used or are present at the MRS to place an MRS into this category.]. 	1
Evidence of no munitions	<ul style="list-style-type: none"> ◆ Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present. 	0
LOCATION OF MUNITIONS	DIRECTIONS: Record the single highest score from above in the box to the right (maximum score = 25).	25

DIRECTIONS: Document any MRS-specific data used in selecting the **Location of Munitions** classifications in the space provided.

A 40mm projectile was found on the surface during SI activities at the site. (Subchapter 6.1.4, 2017 SI Report).

Table 4

EHE Module: Ease of Access Data Element Table

DIRECTIONS: Below are four classifications of barrier types that can surround an MRS and their descriptions. The barrier type is directly related to the ease of public access to any explosive materiel. Circle the score that corresponds with the ease of access to the MRS.

Note: The term *barrier* is defined in Appendix C of the Primer.

Classification	Description	Score
No barrier	<ul style="list-style-type: none"> There is no barrier preventing access to any part of the MRS (i.e., all parts of the MRS are accessible). 	10
Barrier to MRS access is incomplete	<ul style="list-style-type: none"> There is a barrier preventing access to parts of the MRS, but not the entire MRS. 	8
Barrier to MRS access is complete but not monitored	<ul style="list-style-type: none"> There is a barrier preventing access to all parts of the MRS, but there is no surveillance (e.g., by a guard) to ensure that the barrier is effectively preventing access to all parts of the MRS. 	5
Barrier to MRS access is complete and monitored	<ul style="list-style-type: none"> There is a barrier preventing access to all parts of the MRS, and there is active, continual surveillance (e.g., by a guard, video monitoring) to ensure that the barrier is effectively preventing access to all parts of the MRS. 	0
EASE OF ACCESS	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 10).	5

DIRECTIONS: Document any MRS-specific data used in selecting the **Ease of Access** classification in the space provided.

The site is fully contained on BAAF property, access is restricted, and the area is secure. There is an access gate to the general area located approximately 1 mile to the west of the site and a dirt road located just north of the runway running parallel with the runway allows for access to this site. (Subchapter 6.1.4, 2017 SI Report)

Table 5

EHE Module: Status of Property Data Element Table

DIRECTIONS: Below are three classifications of the status of a property within the Department of Defense (DoD) and their descriptions. Circle the score that corresponds with the status of property at the MRS.

Classification	Description	Score
Non-DoD control	<ul style="list-style-type: none"> ◆ The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal, or local governments; and land or water bodies managed by other federal agencies. 	5
Scheduled for transfer from DoD control	<ul style="list-style-type: none"> ◆ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to the control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the rule is applied. 	3
DoD control	<ul style="list-style-type: none"> ◆ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD must control access to the MRS 24 hours per day, every day of the calendar year. 	0
STATUS OF PROPERTY	<p>DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).</p>	

DIRECTIONS: Document any MRS-specific data used in selecting the **Status of Property** classification in the space provided.

The site is fully contained on BAAF property. (Subchapter 6.1.4, 2017 SI Report)

Table 6

EHE Module: Population Density Data Element Table

DIRECTIONS: Below are three classifications of population density and their descriptions. Determine the population density per square mile in the vicinity of the MRS and circle the score that corresponds with the associated population density.

Note: If an MRS is located in more than one county, use the largest population density value among the counties. If the MRS is within or borders a city or town, use the population density for the city or town, rather than that of the county.

Classification	Description	Score
> 500 persons per square mile	<ul style="list-style-type: none"> ◆ There are more than 500 persons per square mile in the county in which the MRS is located, based on U.S. Census Bureau data. 	5
100–500 persons per square mile	<ul style="list-style-type: none"> ◆ There are 100 to 500 persons per square mile in the county in which the MRS is located, based on U.S. Census Bureau data. 	3
< 100 persons per square mile	<ul style="list-style-type: none"> ◆ There are fewer than 100 persons per square mile in the county in which the MRS is located, based on U.S. Census Bureau data. 	1
POPULATION DENSITY	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	5

DIRECTIONS: Document any MRS-specific data used in selecting the **Population Density** classification in the space provided.

The 2010 population density estimate for El Paso County is 790.6 persons per square mile (US Census Bureau). (Subchapter 2.2.4, 2017 SI Report)

Table 7

EHE Module: Population Near Hazard Data Element Table

DIRECTIONS: Below are six classifications describing the number of inhabited structures near the MRS. The number of inhabited buildings relates to the population near the hazard. Determine the number of inhabited structures within two miles of the MRS boundary and circle the score that corresponds with the associated population near the known or suspected hazard.

Note: The term *inhabited structures* is defined in Appendix C of the Primer.

Classification	Description	Score
26 or more inhabited structures	◆ There are 26 or more inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	5
16 to 25 inhabited structures	◆ There are 16 to 25 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	4
11 to 15 inhabited structures	◆ There are 11 to 15 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	3
6 to 10 inhabited structures	◆ There are 6 to 10 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	2
1 to 5 inhabited structures	◆ There are 1 to 5 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	1
0 inhabited structures	◆ There are no inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	0
POPULATION NEAR HAZARD	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	1

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Near Hazard*** classification in the space provided.

No inhabited structures are located within OB Site II. The closest inhabited structures are air field support buildings located less than 3,000 feet southeast of the site. There are Army barracks just within 2 miles of the site. (Subchapter 2.2.4, 2017 SI Report)

Table 8

EHE Module: Types of Activities/Structures Data Element Table

DIRECTIONS: Below are five classifications of activities and/or inhabited structures near the hazard and their descriptions. Review the types of activities that occur and/or structures that are present within two miles of the MRS and circle the score(s) that correspond with all the activities/structure classifications at the MRS.

Note: The term *inhabited structure* is defined in Appendix C of the Primer.

Classification	Description	Score
Residential, educational, commercial, or subsistence	<ul style="list-style-type: none"> ♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with any of the following purposes: residential, educational, child care, critical assets (e.g., hospitals, fire and rescue, police stations, dams), hotels, commercial, shopping centers, playgrounds, community gathering areas, religious sites, or sites used for subsistence hunting, fishing, and gathering. 	5
Parks and recreational areas	<ul style="list-style-type: none"> ♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with parks, nature preserves, or other recreational uses. 	4
Agricultural, forestry	<ul style="list-style-type: none"> ♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with agriculture or forestry. 	3
Industrial or warehousing	<ul style="list-style-type: none"> ♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with industrial activities or warehousing. 	2
No known or recurring activities	<ul style="list-style-type: none"> ♦ There are no known or recurring activities occurring up to two miles from the MRS's boundary or within the MRS's boundary. 	1
TYPES OF ACTIVITIES/STRUCTURES	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	5

DIRECTIONS: Document any MRS-specific data used in selecting the **Types of Activities/Structures** classifications in the space provided.

No inhabited structures are located within OB Site II. The closest inhabited structures are air field support buildings located less than 3,000 feet southeast of the site. The site is fully contained within the boundaries of BAAF. It is located in an industrial use area, just north of the main BAAF runway. The site is not currently in use. The land use for this area as expected to remain the same in the future. (Subchapter 2.2, 2014 SI Report)

Table 9

EHE Module: Ecological and/or Cultural Resources Data Element Table

DIRECTIONS: Below are four classifications of ecological and/or cultural resources and their descriptions. Review the types of resources present and circle the score that corresponds with the ecological and/or cultural resource classifications at the MRS.

Note: The terms *ecological resources* and *cultural resources* are defined in Appendix C of the Primer.

Classification	Description	Score
Ecological and cultural resources present	◆ There are both ecological and cultural resources present on the MRS.	5
Ecological resources present	◆ There are ecological resources present on the MRS.	3
Cultural resources present	◆ There are cultural resources present on the MRS.	3
No ecological or cultural resources present	◆ There are no ecological resources or cultural resources present on the MRS.	0
ECOLOGICAL AND/OR CULTURAL RESOURCES	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	3

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ecological and/or Cultural Resources*** classification in the space provided.

There are a number of threatened and endangered species that occur or have the potential to occur on Fort Bliss. Six species are listed as threatened or endangered by the United States Fish and Wildlife Service (USFWS) and the states of New Mexico and Texas. Of the six species listed, only one species, the Sneed pincushion cactus (*Escobaria [Coryphantha] sneedii*), is both federally and state endangered and is found on Fort Bliss year around. One federally and state threatened species is the bald eagle (*Haliaeetus leucocephalus*), which is a seasonal resident. The northern aplomado falcon (*Falco femoralis septentrionalis*) which is both federally and state endangered has been sighted at Fort Bliss. Habitat for the remaining three listed species, the federally and state endangered interior least tern (*Sterna antillarum*), the southwest willow flycatcher (*Empidonax traillii extimus*), and the federally threatened Mexican spotted owl (*Strix occidentalis lucida*) species do not exist or are of an insufficient amount to maintain a population. These species have passed, or may pass, through portions of Fort Bliss (engineering-environment Management, Inc., 2007). (Subchapter 5.2.5, 2017 SI Report)

Table 10
Determining the EHE Module Rating

	Source	Score	Value
DIRECTIONS:	Explosive Hazard Factor Data Elements		
1.	Munitions Type	Table 1	15
2.	Source of Hazard	Table 2	8
Accessibility Factor Data Elements			
3.	Location of Munitions	Table 3	25
4.	Ease of Access	Table 4	5
5.	Status of Property	Table 5	0
Receptor Factor Data Elements			
6.	Population Density	Table 6	5
7.	Population Near Hazard	Table 7	1
8.	Types of Activities/ Structures	Table 8	5
9.	Ecological and /or Cultural Resources	Table 9	3
EHE MODULE TOTAL			67
EHE Module Total		EHE Module Rating	
92 to 100		A	
82 to 91		B	
71 to 81		C	
60 to 70		D	
48 to 59		E	
38 to 47		F	
less than 38		G	
Alternative Module Ratings		Evaluation Pending	
		No Longer Required	
		No Known or Suspected Explosive Hazard	
EHE MODULE RATING			D

Table 11

CHE Module: CWM Configuration Data Element Table

DIRECTIONS: Below are seven classifications of CWM configuration and their descriptions. Circle the score(s) that correspond to all CWM configurations known or suspected to be present at the MRS.

Note: The terms *CWM/UXO*, *CWM/DMM*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
CWM, explosive configuration either UXO or damaged DMM	The CWM known or suspected of being present at the MRS is: <ul style="list-style-type: none">♦ Explosively configured CWM that are UXO (i.e., CWM/UXO).♦ Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged.	30
CWM mixed with UXO	♦ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged, or nonexplosively configured CWM/DMM, or CWM not configured as a munition, that are commingled with conventional munitions that are UXO.	25
CWM, explosive configuration that are undamaged DMM	♦ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged.	20
CWM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS is: <ul style="list-style-type: none">♦ Nonexplosively configured CWM/DMM.♦ Bulk CWM/DMM (e.g., ton container).	15
CAIS K941 and CAIS K942	♦ The CWM/DMM known or suspected of being present at the MRS is CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M-2/E11.	12
CAIS (chemical agent identification sets)	♦ Only CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS.	10
Evidence of no CWM	♦ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	0
CWM CONFIGURATION	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 30).	0

DIRECTIONS: Document any MRS-specific data used in selecting the **CWM Configuration** classifications in the space provided.

There is no historical basis for the potential of CWM. No physical evidence contradicting this conclusion has been found during SI activities. No analysis for CWM has been performed for any of the media collected during the SI. Therefore, Tables 12-19 are omitted, and the CHE Module is given a rating of "No known or suspected CWM hazard". (Application of MRSPP for the FUDS MMRP SI Program, 3/8/2007 COE Memo.)

Table 20
Determining the CHE Module Rating

	Source	Score	Value
DIRECTIONS:	CWM Hazard Factor Data Elements		
1. From Tables 11–19, record the data element scores in the Score boxes to the right.	CWM Configuration	Table 11	0
	Sources of CWM	Table 12	0
Accessibility Factor Data Elements			
2. Add the Score boxes for each of the three factors and record this number in the Value boxes to the right.	Location of CWM	Table 13	0
	Ease of Access	Table 14	0
	Status of Property	Table 15	0
Receptor Factor Data Elements			
3. Add the three Value boxes and record this number in the CHE Module Total box below.	Population Density	Table 16	0
4. Circle the appropriate range for the CHE Module Total below.	Population Near Hazard	Table 17	0
5. Circle the CHE Module Rating that corresponds to the range selected and record this value in the CHE Module Rating box found at the bottom of the table.	Types of Activities/ Structures	Table 18	0
	Ecological and /or Cultural Resources	Table 19	0
CHE MODULE TOTAL			0
CHE Module Total	CHE Module Rating		
92 to 100	A		
82 to 91	B		
71 to 81	C		
60 to 70	D		
48 to 59	E		
38 to 47	F		
less than 38	G		
Alternative Module Ratings	Evaluation Pending		
	No Longer Required		
	No Known or Suspected CWM Hazard		
CHE MODULE RATING		No Known or Suspected CWM Hazard	

Note:

An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

Table 21
HHE Module: Groundwater Data Element Table
Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's groundwater and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Contaminant	Maximum Concentration ($\mu\text{g/L}$)	Comparison Value ($\mu\text{g/L}$)	Ratios
CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record the CHF Value from above in the box to the right (maximum value = H).		
Migratory Pathway Factor			
DIRECTIONS: Circle the value that corresponds most closely to the groundwater migratory pathway at the MRS.			
Classification	Description	Value	
Evident	Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure.	H	
Potential	Contamination in groundwater has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M	
Confined	Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to geological structures or physical controls).	L	
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).		
Receptor Factor			
DIRECTIONS: Circle the value that corresponds most closely to the groundwater receptors at the MRS.			
Classification	Description	Value	
Identified	There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer).	H	
Potential	There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer).	M	
Limited	There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only).	L	
RECEPTOR FACTOR	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).		
No Known or Suspected Groundwater MC Hazard <input checked="" type="checkbox"/>			

No groundwater wells are located at OB Site II. Exposure pathways are considered incomplete for all site receptors.
 (Subchapter 5.3.2, 2017 SI Report)

Table 22

HHE Module: Surface Water – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for human endpoints present in the surface water, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Contaminant	Maximum Concentration ($\mu\text{g/L}$)	Comparison Value ($\mu\text{g/L}$)	Ratios
CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record the CHF Value from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	
No Known or Suspected Surface Water (Human Endpoint) MC Hazard		<input checked="" type="checkbox"/>

Surface water and sediment are not present at OB Site II and therefore exposure pathways are considered incomplete for all site receptors. (Subchapter 5.3.3, 2017 SI Report)

Table 23
HHE Module: Sediment – Human Endpoint Data Element Table
Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the site's sediment and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for human endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum$ [Maximum Concentration of Contaminant]	
100 > CHF > 2	M (Medium)	[Comparison Value for Contaminant]	
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record the CHF Value from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M

No Known or Suspected Sediment (Human Endpoint) MC Hazard

Surface water and sediment are not present at OB Site II and therefore exposure pathways are considered incomplete for all site receptors. (Subchapter 5.3.3, 2017 SI Report)

Table 24

HHE Module: Surface Water – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for ecological endpoints present in the surface water, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Contaminant	Maximum Concentration ($\mu\text{g}/\text{L}$)	Comparison Value ($\mu\text{g}/\text{L}$)	Ratios
CHF Scale	CHF Value		Sum the Ratios
CHF > 100	H (High)	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		
Migratory Pathway Factor			
DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.			
Classification	Description	Value	
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H	
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M	
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L	
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).		
Receptor Factor			
DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.			
Classification	Description	Value	
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H	
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M	
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L	
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).		
No Known or Suspected Surface Water (Ecological Endpoint) MC Hazard <input checked="" type="checkbox"/>			

Surface water and sediment are not present at OB Site II and therefore exposure pathways are considered incomplete for all site receptors. (Subchapter 5.3.3, 2017 SI Report)

Table 25

HHE Module: Sediment – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for ecological endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
CHF Scale	CHF Value	Sum the Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[Maximum\ Concentration\ of\ Contaminant]}{[Comparison\ Value\ for\ Contaminant]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record the CHF Value from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Ecological Endpoint) MC Hazard

Surface water and sediment are not present at OB Site II and therefore exposure pathways are considered incomplete for all site receptors. (Subchapter 5.3.3, 2017 SI Report)

Table 26

HHE Module: Surface Soil Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface soil and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratio
CHF Scale	CHF Value	Sum the Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[Maximum\ Concentration\ of\ Contaminant]}{[Comparison\ Value\ for\ Contaminant]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		L
Migratory Pathway Factor			
DIRECTIONS: Circle the value that corresponds most closely to the surface soil migratory pathway at the MRS.			
Classification	Description	Value	
Evident	Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure.	H	
Potential	Contamination in surface soil has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M	
Confined	Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L	
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	M	
Receptor Factor			
DIRECTIONS: Circle the value that corresponds most closely to the surface soil receptors at the MRS.			
Classification	Description	Value	
Identified	Identified receptors have access to surface soil to which contamination has moved or can move.	H	
Potential	Potential for receptors to have access to surface soil to which contamination has moved or can move.	M	
Limited	Little or no potential for receptors to have access to surface soil to which contamination has moved or can move.	L	
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	M	
No Known or Suspected Surface Soil MC Hazard			<input checked="" type="checkbox"/>

No explosives were detected in the surface soil collected. No MC metals were detected above the selected background criteria. No PAHs were detected above the PALs. (Subchapter 5.3.4.5, 2017 SI Report)

Table 27

HHE Module: Supplemental Contaminant Hazard Factor Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Only use this table if there are more than five contaminants present at the MRS. This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the **media** in which these contaminants are present. Then record all **contaminants**, their **maximum concentrations** and their **comparison values** (from Appendix B) in the table below. Calculate and record the **ratio** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** for each medium on the appropriate media-specific tables.

Note: Remember not to add ratios from different media.

Table 28
Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the **Contaminant Hazard, Migration Pathway, and Receptor Factors** for the media (from Tables 21–26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the **Three-Letter Combination** boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the reference provided below, determine each media's rating (A–G) and record the letter in the corresponding **Media Rating** box below.

Media (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value	Three-Letter Combination (Hs-Ms-Ls)	Media Rating (A-G)
Groundwater (Table 21)	-	-	-	-	-
Surface Water/Human Endpoint (Table 22)	-	-	-	-	-
Sediment/Human Endpoint (Table 23)	-	-	-	-	-
Surface Water/Ecological Endpoint (Table 24)	-	-	-	-	-
Sediment/Ecological Endpoint (Table 25)	-	-	-	-	-
Surface Soil (Table 26)	-	-	-	-	-

DIRECTIONS (cont.):

4. Select the single highest Media Rating (A is highest; G is lowest) and enter the letter in the **HHE Module Rating** box below.

Note:

An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

HHE MODULE RATING

HHE Ratings (for reference only)

Combination	Rating
HHH	A
HHM	B
HHL	C
HMM	
HML	D
MMM	
HLL	E
MML	
MLL	F
LLL	G
	Evaluation Pending
	No Longer Required
Alternative Module Ratings	No Known or Suspected MC Hazard

Table 29

MRS Priority

DIRECTIONS: In the chart below, circle the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Circle the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS priority is the single highest priority; record this number in the **MRS or Alternative Priority** box at the bottom of the table.

Note: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	1		
A	2	B	2	A	2
B	3	C	3	B	3
C	4	D	4	C	4
D	5	E	5	D	5
E	6	F	6	E	6
F	7	G	7	F	7
G	8			G	8
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard	No Known or Suspected CWM Hazard			No Known or Suspected MC Hazard	
MRS or ALTERNATIVE PRIORITY				5	